The Presence of *Hyla squirella* in the Bahamas

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Barbour (1904) was the first to record the tree frog *Hyla squirella* Sonnini from the Bahamas, on the basis of Museum of Comparative Zoology (MCZ) 2419 and 51983 collected by G. M. Allen on Stranger's Cay, a small island north of Grand Bahama. Steineger (1905) accepted this and included *H. squirella* in the Bahamian fauna. Barbour (1914, 1930, 1935) retained the species as part of the Antillean fauna in his zoogeographic study and in his first and second lists of Antillean reptiles and amphibians. However, he deleted *Hyla squirella* from the third list (1937) without comment; the species has remained unreported and the record unconfirmed since.

Barbour (1914) re-examined the two Stranger's Cay specimens and compared them with *Hyla femoralis* and *H. carolinensis* (=*cinerea*). He concluded that "there can be no doubt" that they were *squirella*, although he did not compare them with the native Bahamian species, *H. septentrionalis*.

The two "*squirella*" were reidentified as juvenile *Hyla septentrionalis* in the mid 1930's. This presumably was Barbour's reason for deleting the species from his 1937 list. I have examined the specimens and agree that they are recognizable as *H. septentrionalis*, although both are immature (20.3 and 21.1 mm, respectively) and not particularly well preserved.

Despite the reidentification of Barbour's material, the question still remains whether *squirella* does actually occur on Stranger's Cay. Barbour (1904) said of the supposed *squirella*, "Here they were common; and their chirp, as was pointed out at the time by Dr. Allen, who found them, was noticeably different from that of the other indigenous batrachians." He reported no other "indigenous batrachians" from Stranger's Cay in either 1904 or 1914. Furthermore, neither the call of *Hyla septentrionalis* nor that of *Hyla squirella* could be accurately called a "chirp". It must be assumed that Allen was mistaken in his belief that the frogs he collected were producing the sound. Thus, based on present information, it seems unlikely that *Hyla squirella* occurred on Stranger's Cay in Allen's time.

Fig. 1. Map of the Little Bahama Bank, showing Grand Bahama localities for *Hyla squirella* (solid dots). Stranger's Cay is indicated by an arrow.

While studying the MCZ Bahamian collections, I found a number of specimens of recently collected *Hyla squirella*, and later found that additional specimens were recorded in the Albert Schwartz Field Series (ASFS). All are from Grand Bahama; the specimens examined include: MCZ 50631-3; Lucaya, Sept. 15; Oct. 28, 1964. MCZ 52210-2; Lucaya Beach, Dec. 9 and 16, 1964. ASFS V2036-41; West End, July 5, 1959. ASFS V7155; 8 mi. SE West End, Jan. 24, 1966. ASFS V7175-6; 8.2 mi. SE West End, Jan. 24, 1966. ASFS V13604-7; 8.7 mi. NW Eight Mile Rock, Jan. 14, 1968.

All this material is from the western, more heavily populated section of the island. The field notes of James J. O'Hara state that ASFS V2036-41 were collected in a chorus at the West End International Airport. The most easterly record of the species is Lucaya, which is very close to the Freeport International Airport.

The Grand Bahama population is unquestionably the result of an introduction. However, the exact means of introduction is uncertain. The centers of population density around the Bahamian airports plus the abundance of *squirella* around the Miami International Airport freight areas would suggest that the introduction is a byproduct of the heavy air traffic between Miami and Grand Bahama. It is strange, however, that *squirella* has not been found in the vicinity of Nassau on New Providence, since that city shares with Grand Bahama immense popularity as an easily accessible foreign vacation area. It seems logical that stowaways could have turned up there also.

In view of the hit-and-miss prospects for survival of most introduced populations, it is conceivable that the species has been carried to other islands and has not survived. The possible salt tolerance of *squirella* (Neill, 1958) would indicate that this species may be an effective island colonizer and it would not be surprising to find additional colonies on other Antillean islands in the future.

No deleterious ecological effects seem likely from the introduction of *Hyla squirella.* Although the species appears to be well established and breeding on Grand Bahama (MCZ 50633 is a gravid female), it is not likely to become a pest. *Hyla squirella* is a small, arboreal species, which breeds in fresh water pools. It is unlikely that it competes with the local *Eleutherodactylus,* which are terrestrial frogs that breed in wet earth. It is even less likely that *squirella* represents any threat to the much larger Cuban tree frog, *Hyla septentrionalis.* These two species already occur sympatrically in the Keys and along the southern coasts of Florida with no apparent conflict. In fact, it is possible that *septentrionalis* may inhibit the spread of *squirella* in the Bahamas. The Cuban tree frog is an extremely adaptable and hardy creature that can and does feed on other frogs. This species' spread from its native Cuba has been aided by an apparently high salt tolerance (Neill, 1958; Peterson et al., 1952) and by an ability to adapt to life around humans.

SUMMARY

Whereas the earlier record of *Hyla squirella* (Salientia: Hylidae) from Stranger's Cay (Barbour, 1904) is refuted, a relatively recent, unreported population on Grand Bahama is discussed. This

colony probably resulted from the heavy air traffic between Miami and Freeport-West End. No injurious results of this introduction are foreseen. It seems possible that *Hyla squirella* will become established in other suitable Bahamian localities in much the same manner as the Grand Bahama population.

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